UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/866,414	05/25/2001	Fred Discenzo	01AB121	6236

7590   05/02/2008

William R. Walbrun
Rockwell Automation (Allen-Bradley Co., Inc.)
1201 South Second Street
Milwaukee, WI 53204

EXAMINER
CHANG, JUNGWON

ART UNIT	PAPER NUMBER
2154	

MAIL DATE	DELIVERY MODE
05/02/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

	Application No.	Applicant(s)
Office Action Summary	09/866,414	DISCENZO ET AL.
	Examiner	Art Unit	
	JUNGWON CHANG	2154	

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on <u>11 April 2008</u>.

2a) ☐ This action is **FINAL**.   2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) *1-17,19-37,41-43,45-49,53-55 and 57-59* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) *1-17,19-37,41-43,45-49,53-55 and 57-59* is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1. ☐ Certified copies of the priority documents have been received.

      2. ☐ Certified copies of the priority documents have been received in Application No. _____.

      3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail. Date _____.

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

1.   This action is in response to RCE filed on 4/11/08. Claims 18, 38-40, 44, 50-52,

56 have been canceled.

2.   Claims 1-17, 19-37, 41-43, 45-49, 53-55 and 57-59 are presented for

examination.

3.   A request for continued examination under 37 CFR 1.114 was filed in this

application after appeal to the Board of Patent Appeals and Interferences, but prior to a

decision on the appeal. Since this application is eligible for continued examination

under 37 CFR 1.114 and the fee set forth in 37 CFR 1.17(e) has been timely paid, the

appeal has been withdrawn pursuant to 37 CFR 1.114 and prosecution in this

application has been reopened pursuant to 37 CFR 1.114. Applicant's submission filed

on 4/11/08 has been entered.

Claim Rejections - 35 USC § 103

4.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

5.   **Claims 1-7, 10, 11, 15, 31-34, 36, 37, 41-43, 45-47, 49, 53-55 and 57-59** are

rejected under 35 U.S.C. 103(a) as being obvious over Hays (US 6,260,004 B1),

hereinafter Hays, in view of Grimm et al. (US 6,369,472 B1), hereinafter Grimm, further

in view of Kato et al, (US 6,415,200), hereinafter Kato.

6.   As for claims 1 and 32, Hays discloses a diagnostics and control system for

controlling a motorized system and diagnosing the health thereof, comprising:

    a controller (micro-controller/PID controller 188, Fig. 4a) that conveys a control

    signal to a motor drive (12, 14, fig. 1) to operate the motorized system (10, fig. 1) in

    a controlled fashion (col. 14, line 55 – col. 15, line 15); and

    a diagnostics system (diagnostic apparatus 24 includes motor vibration sensor 86,

rotating machine seal leakage detector or sensor 94, oil contamination sensor 96,

viscosity degradation sensor 98, torque sensor 100, corrosion sensor 104, ultrasonic

thickness sensor 106, accelerometer 108; col. 13, line 7 – col. 14, line 7) integrated with

the controller (micro-controller/PID controller 188, Fig. 4a; col. 14, line 55 – col. 15, line

15) and the motor (motor or rotating machine, 12, 14, fig. 1) to comprises a single unit

(fig. 1) that diagnoses the health of the motorized system according to a measured

attribute associated with the motorized system, the diagnostics system providing a

diagnostics signal to the controller (col. 6, lines 23-42, "The system pparatus…reducing

pump wear."; col. 20, lines 65-68, "If diagnostic information…increases pump life.").

7.   Hays discloses a diagnostics system (diagnostic apparatus 24 includes motor

vibration sensor 86, rotating machine seal leakage detector or sensor 94, oil

contamination sensor 96, viscosity degradation sensor 98, torque sensor 100, corrosion

sensor 104, ultrasonic thickness sensor 106, accelerometer 108; col. 13, line 7 – col.

14, line 7) integrated with the controller (micro-controller/PID controller 188, Fig. 4a; col.

14, line 55 – col. 15, line 15) and the motor (motor or rotating machine, 12, 14, fig. 1) to

comprises a single unit (fig. 1). Grimm also discloses a diagnostics system integrated

with the controller and the motor drive to comprises a single unit (20, fig. 1; col. 2, lines

27-32; col. 2, line 44 – col. 3, line 35; col. 4, claims 16; col. 5, claim 17). It would have

been obvious to one of ordinary skill in the art at the time the invention was made to

combine the teachings of Hays and Grimm because Grimm's integration of controller,

motor and diagnostics would optimize the performance of arrangement of the system by

accurately diagnosing problems and predicting the future state of the system based on

operating characteristics of the electric motor (Grimm, col. 1, lines 5-11; col. 2, lines 27-

32).

7.   As for claim 18, Hays does not specifically disclose including a post processing

portion that is a fuzzy rule based expert system. However, Kato discloses including a

post processing portion that is a fuzzy rule based expert system (col. 25, lines 25-40;

col. 26, lines 4-67 – col. 27, line 4; col. 27, lines 21-35; col. 28, line 57 – col. 29, line 6).

It would have been obvious to one of ordinary skill in the art to modify the teachings of

Hays and Kato because Kato's teaching would improve accuracy of making decisions

based on the rules of diagnosis or control, as taught by Kato (col. 2, lines 24-36).

8.   As for claim 2, Hays discloses the diagnostics and control system of claim 1, the

measured attribute comprises at least one of vibration, pressure, current, speed, and

temperature (col. 1, lines 40-65, "Vibration monitoring equipment…called an 'orbit.'";

"col. 10, line 49 - col. 11, line 29, "Diagnostics apparatus 24…computing device 38.";

vibration sensor 80, Fig. 1; col. 12, lines 63-66, "Machine sensors may…rotating

equipment 14.").

9.   As for claim 3, Hays discloses the diagnostics and control system of claim 1, the

motorized system comprises a motor and a load, and the load comprises at least one of

a valve, a pump, a conveyor roller, a fan, a compressor, and a gearbox (col. 6, lines 46-

57, "Thus, the present invention…equipment monitoring variables.").

10.   As for claim 4, Hays discloses the diagnostics and control system of claim 1, the

diagnostics system provides a diagnostics signal according to the health of the

motorized system, and the controller provides a control signal to the motorized system

according to at least one of a setpoint and the diagnostics signal (col. 14, lines 45-62,

"In one embodiment…to rotating machine 14.").

11.   As for claim 5, Hays discloses the diagnostics and control system of claim 1, the

measured attribute comprises at least one vibration signal obtained from a sensor

associated with a motor in the motorized system (vibration sensor 80, Fig. 1; col. 12,

lines 63-66, "Machine sensors may…rotating equipment 14."; col. 13, lines 7-12,

"Diagnostic apparatus 24…variables thereto.").

12.   As for claim 6, Hays discloses the diagnostics and control system of claim 5, the

diagnostics system is adapted to diagnose the health of at least one of a motor bearing,

motor shaft alignment, and motor mounting according to the measured vibration (col.

13, lines 7-12, "Diagnostic apparatus 24…variables thereto.").

13.   As for claim 7, Hays discloses the diagnostics and control system of claim 6, the

diagnostics system performs frequency spectral analysis of the vibration signal (col. 24,

lines 31-55, "Referring to Fig. 16…by box 1614.").

14.   As for claim 10, Hays discloses the diagnostics and control system of claim 1,

The motorized system comprises a motorized pump, the measured attribute comprises

at least one vibration signal obtained from a sensor associated with the pump, and the

diagnostics system is adapted to diagnose the health of the pump according to the

measured vibration (col. 12, lines 63-66, "Machine sensors may…rotating equipment

14."; col. 13, lines 7-12, "Diagnostic apparatus 24…variables thereto.").

15.   As for claim 11, Hays discloses the diagnostics and control system of claim 10,

the diagnostics system is adapted to perform frequency spectral analysis of the

vibration signal (col. 24, lines 31-55, "Referring to Fig. 16…by box 1614.").

16.   As for claim 15, Hays discloses the diagnostics and control system of claim 1,

the motorized system comprises a motorized pump, the measured attribute comprises a

current associated with a motor in the motorized system, and the diagnostics system

provides a diagnostics signal indicative of pump cavitation according to the measured

current (col. 8, lines 44-48, "The method is based…wear and tear."; col. 13, lines 13-18,

"By receiving data…impending maintenance.").

17.   As for claim 31, Hays discloses the diagnostics and control system of claim 1,

the diagnostics system comprises at least one of a neural network, an expert system,

and a data fusion component (col. 4, lines 27-52, "MARINTEK has undertaken…for

pump maintenance.").

18.   As for claim 33, Hays discloses the method of claim 32, further comprising

providing a diagnostics signal indicative of the health of the motorized system, operating

the motor comprises controlling the motor according to at least one of a setpoint and the

diagnostics signal (col. 14, lines 45-62, "In one embodiment…to rotating machine 14.").

19.   As for claim 34, Hays discloses the method of claim 33, further comprising

measuring an attribute associated with the motorized system, providing the diagnostics

signal comprises obtaining a frequency spectrum of the measured attribute and

analyzing the frequency spectrum in order to detect at least one fault in the motorized

system (col. 24, lines 31-55, "Referring to Fig. 16…by box 1614.").

20.   As for claim 36, Hays discloses the method of claim 32, diagnosing the health of

the motorized system according to a measured attribute associated with the motorized

system comprises:

    providing the measured attribute to at least one of a neural network, an expert

    system, and a data fusion component (col. 4, lines 41-52, "Recent published

    research…for pump maintenance."); and

    providing a diagnostics signal indicative of the health of the motorized system

    from the at least one of a neural network, an expert system, and a data fusion

    component (col. 4, lines 41-52, "Recent published research…for pump

    maintenance.").

21.   As for claim 37, Hays discloses the method of claim 36, operating the motor

comprises controlling the motor according to at least one of a setpoint and the

diagnostics signal (col. 14, lines 55-62, "In another embodiment…to rotating machine

14.").

22.   As for claims 41 and 42, they are rejected for the same reasons set forth in

claims 1 and 32 above. In addition, Hays discloses an integrated control and

diagnostics system for a motor, the system comprising:

a diagnostics module to generate a health assessment signal indicative of the

health of the motor (computer 38, Fig. 1; col. 6, lines 23-42, "The system

apparatus...reducing pump wear.");

a controller integrated with the diagnostics module and coupled to a motor

device, the controller outputting a driving output based on the health assessment

signal, the driving output is applied to the motor device (micro-controller/PID

controller 188, Fig. 4a; col. 6, lines 23-42, "The system apparatus...reducing pump

wear."), the motor drive and the controller integrated with the diagnostics module

form an indivisible unit.

23.   As for claim 43, Hays discloses the control and diagnostics system according to

claim 41, the controller is associated with at least one controllable parameter, the

parameter being controllable in response to the health assessment signal (col. 6, lines

23-42, "The system apparatus...reducing pump wear.").

24.   As for claim 45, Hays discloses the control and diagnostics system according to

claim 41, further including at least one sensor, the sensor generating a signal indicative

of a parameter associated with the motor, the health assessment signal is based on the

sensor signal (col. 13, lines 7-18, "Diagnostic apparatus...impending maintenance.").

25.   As for claim 46, Hays discloses the control and diagnostics system according to

claim 45, the controller includes a velocity feedback loop and a torque feedback loop

(col. 13, lines 39-50, "Additional machine sensors…rotating machine 14.").

26.   As for claim 47, Hays discloses the control and diagnostics system according to

claim 46, the velocity feedback loop generates a current reference signal in response to

the sensor signal, and the torque feedback loop generates the driving output in

response to the current reference signal (col. 13, lines 39-50, "Additional machine

sensors…rotating machine 14.").

27.   As for claim 49, Hays discloses the control and diagnostics system according to

claim 45, the motor parameter is one of a group consisting of velocity and vibration (col.

13, lines 7-18, "Diagnostic apparatus…impending maintenance.").

28.   As for claim 53, Hays discloses the control and diagnostics system according to

claim 41, the diagnostics module includes an ASIC that generates the health

assessment signal based on a process constraint (Fig. 4a).

29.   As for claim 54, Hays discloses the control and diagnostics system according to

claim 42, the health assessment signal is indicative of whether the motor is deviating

from a normal operating characteristic (col. 6, lines 23-42, "The system

apparatus…reducing pump wear.").

30.   As for claim 55, Hays discloses the control and diagnostics systems according to

claim 41, further comprising a coordination module coupled to a plurality of the control

and diagnostics systems, the coordination module alters the driving output associated

with one of the control and diagnostics systems based on the driving output of another

one of the control and diagnostics systems (col. 13, lines 39-50, "Additional machine

sensors…rotating machine 14.").

31.   As for claim 57, it is rejected for the same reasons set forth in claims 1 and 32

above. In addition, Hays discloses an integrated control and diagnostics system,

comprising:

      means for controlling a motorized system utilizing a health assessment signal

    indicative of the health of the motorized system (micro-controller/PID controller 188,

    Fig. 4a; col. 16, line 26 – col. 17, line 3; col. 20, lines 65-68); and

      means for generating the health assessment signal, the means for generating

    integrated with the means for controlling (col. 16, lines 26-54).

32.   As for claim 58, it is rejected for the same reasons set forth in claims 1 and 32

above. In addition, Hays discloses a composite control and diagnostics system to

control a motor, comprising:

      means for effectuating movement of the motor in a controlled fashion based in

    part on a health assessment signal (col. 16, lines 26-54; col. 20, lines 65-68);

means for formulating the health assessment signal, the means for effectuating

movement and the means for formulating the health signal forming an integrated unit

(Fig. 4a; col. 16, lines 26-54).

33.   As for claim 59, it is rejected for the same reasons set forth in claims 1 and 32

above. In addition, Hays discloses an integrated control and diagnostics system,

comprising:

means for diagnosing the health of a motorized system integrated with a means

for controlling the motorized system, the means for diagnosing producing a signal

(col. 16, lines 26-54; col. 20, lines 65-68); and

means for communicating the signal to the means for controlling (col. 20, lines

65-68).

34.   **Claims 8, 9, 12-14, 16-17 and 19** are rejected under 35 U.S.C. 103(a) as being

obvious over Hays (US 6,260,004 B1), Grimm, Kato, further in view of Ogi et al (US

5,419,197) (hereinafter Ogi).

35.   As for claims 8 and 12, although Hays discloses the use of artificial intelligence in

control networks (col. 4, lines 41-52, "Recent published research…for pump

maintenance."), Hays and Grimm do not specifically disclose a diagnostics system

comprising at least one of a neural network or an expert system, wherein frequency

spectral analysis is performed using the at least one of a neural network or expert

system. Ogi teaches a diagnostics system comprising at least one of a neural network

or an expert system, wherein frequency spectral analysis is performed using the at least

one of a neural network or expert system (col. 2, lines 29-57, "In order to achieve…the

lapse of time."; col. 4, lines 45-57, "Subsequently, the normalized…the power supply.").

It would have been obvious to one of ordinary skill in the art to modify Hays and Grimm

by using a diagnostics system comprising at least one of a neural network or an expert

system, wherein frequency spectral analysis is performed using the at least one of a

neural network or expert system, because this would provide the advantage of an

adaptable system that can be used with a variety of sensor and equipment types, as

taught by Hays (col. 2, lines 18-28, "It is an object…the lapse of time.").

36.   As for claims 9 and 13, Hays discloses a diagnostics and control system similar

to claims 8 and 12, the controller provides a control signal to the motorized system

according to at least one of a setpoint and the diagnostics signal (col. 14, lines 45-62,

"In one embodiment…to rotating machine 14.").

37.   As for claim 14, Hays discloses a diagnostics and control system similar to claim

12, the diagnostics system employs data fusion techniques in order to derive the at

least one vibration signal from at least one sensor associated with the motorized system

(col. 4, lines 41-52, "Recent published research…for pump maintenance.").

38.   As for claim 16, although Hays discloses the use of artificial intelligence in control

networks (col. 4, lines 41-52, "Recent published research…for pump maintenance."),

Hays and Grimm do not specifically disclose a diagnostics system comprising a neural

network adapted to synthesize a change in condition signal from the measured current.

Ogi discloses a neural network adapted to synthesize a change in condition signal from

the measured current (col. 2, lines 29-57, "In order to achieve…the lapse of time."; col.

4, lines 45-57, "Subsequently, the normalized…the power supply."). It would have been

obvious to one of ordinary skill in the art to modify Hays by using a diagnostics system

comprising a neural network adapted to synthesize a change in condition signal from

the measured current, because this would provide the advantage of an adaptable

system that can be used with a variety of sensor and equipment types, as taught by

Hays (col. 2, lines 18-28, "It is an object…the lapse of time.").

39.   As for claim 17, Hays and Grimm do not specifically teach the use of a

preprocessing portion operatively coupled to neural network nor a post processing

portion coupled to the neural network for determining whether the change in condition

signal is due to a fault condition. Ogi teaches the use of a preprocessing portion

operatively coupled to neural network and a post processing portion coupled to the

neural network for determining whether the change in condition signal is due to a fault

condition (col. 4, lines 9-13, "A processor 10 further…digital computer.").

40.   As for claim 19, Hays discloses a diagnostics and control system similar to claim

18, the diagnostics system detects at least one fault relating to the operation of the

pump and at least one fault relating to the operation of the motor driving the pump

according to the measured current (col. 12, lines 63-66, "Machine sensors

may…rotating equipment 14."; col. 13, lines 7-12, "Diagnostic apparatus 24…variables

thereto.").

41.   **Claims 20-30 and 35** are rejected under 35 U.S.C. 103(a) as being obvious over

Hays (US 6,260,004 B1), Grimm, Kato, further in view of Petsche et al (US 5,640,103).

42.   As for claims 20-26 and 35, although obvious to one of ordinary skill in the art,

Hays and Grimm do not specifically disclose obtaining a space vector angular

fluctuation from a current signal relating to operation of the motor in order to detect a

fault in the motor. Petsche teaches obtaining a space vector angular fluctuation from a

current signal relating to operation of the motor in order to detect a fault in the motor

(col. 3, line 52-col. 4, line 2, "In accordance with…the training phase."). It would have

been obvious to one of ordinary skill in the art at the time of the invention to modify

Hays and Grimm by obtaining a space vector angular fluctuation from a current signal

relating to operation of the motor in order to detect a fault in the motor, because this

would facilitate the detection and correction of motor faults, as taught by Petsche (col. 1,

lines 8-19, "The present invention…or abnormally, respectively."). Furthermore, the

various modifications recited in claims 22-26 would be obvious to one of ordinary skill in

the art because, as demonstrated by Petsche, the use of space vectors for representing

and analyzing time-varying current signals is well known in the art.

43.   As for claim 27, Hays discloses the diagnostics and control system of claim 26,

the diagnostics system is adapted to analyze fluctuations in amplitude of the first

spectral component in order to detect at least one fault associated with the motorized

system (col. 1, line 48 - col. 2, line 14, "Monitoring machine performance…CSI

Application paper….").

44.   As for claim 28, Hays discloses the diagnostics and control system of claim 27,

the first frequency is approximately twice the frequency of power applied to a motor in

the motorized system (col. 1, line 48 - col. 2, line 14, "Monitoring machine

performance…CSI Application paper….").

45.   As for claim 29, Hays and Grimm do not specifically disclose the use of the

Goertzel algorithm. "Official Notice" is given that both the use and advantages of the

Goertzel algorithm are well known and expected in the art. It would have been obvious

to one of ordinary skill in the art at the time of the invention to modify Hays and Grimm

by using a Goertzel algorithm to extract the amplitude of the first spectral component in

order to analyze the amplitude of the first spectral component, because this is a well

known method of spectral analysis.

46.   As for claim 30, Hays discloses the diagnostics and control system of claim 29,

the at least one fault comprises at least one of a stator fault, a rotor fault, and an

imbalance in the power applied to the motor in the motorized system (col. 13, lines 7-18,

"Diagnostic apparatus…impending maintenance.").

47.   **Claim 48** is rejected under 35 U.S.C. 103(a) as being obvious over Hays (US

6,260,004 B1), Grimm, Kato, further in view of Gotou et al (US 4,933,834) (hereinafter

Gotou).

48.   As for claim 48, Hays and Grimm do not specifically disclose the use of P-I

controller to generate the current reference signal. Gotou teaches the use of a P-I

controller in a velocity feedback loop to generate the current reference signal (col. 1,

lines 13-31, "In conventional control systems…in recent years."). It would have been

obvious to one of ordinary skill in the art at the time of the invention to modify Hays and

Grimm by using a P-I controller to generate the current reference signal in a velocity

feedback loop, because PI controllers are widely used in motor control systems to

improve robustness and suppress the influence of disturbances, as taught by Gotou

(col. 1, lines 13-31, "In conventional control systems…in recent years.").

Response to Arguments

49.   Applicant's arguments with respect to claims 1-17, 19-37, 41-43, 45-49, 53-55

and 57-59 have been considered but are moot in view of the new ground(s) of rejection.

50.   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to JUNGWON CHANG whose telephone number is

(571)272-3960. The examiner can normally be reached on M-F 6:30 - 2:00.

        If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Nathan Flynn can be reached on 571-272-1915. The fax phone number for

the organization where this application or proceeding is assigned is 571-273-8300.

        Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

USPTO Customer Service Representative or access to the automated information

system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/JUNGWON CHANG/
Primary Examiner, Art Unit 2154
April 28, 2008